

Silver Bow Creek/Butte Area Superfund Site (Site)

Summary and Stats:

01/22/18

Site Wide:

The Silver Bow Creek/Butte Area Superfund site (the Site) is one of four contiguous Superfund sites in the upper Clark Fork River Basin in southwestern Montana. The other sites are the Anaconda Smelter Superfund site, the Milltown reservoir/Clark Fork River Superfund site and the Montana Pole Treating Plant Superfund site. The Site covers about 85 square miles, including the entire length of the Silver Bow Creek and associated land contamination from Silver Bow Creek above the confluence with Blacktail Creek westward approximately 26 miles to the Warm Springs Ponds. Silver Bow Creek was listed on the Superfund National Priorities List 1983, and Butte was added in 1987. The Site was first divided into 13 distinct areas based on their complexity and were later combined into the 7 Operable Units (OUs) that are summarized below:

Stream Side Tailing Operable Unit (SSTOU 01)

Summary:

The SSTOU surface area consists of about 26 linear miles of Silver Bow Creek and fluvially deposited tailings along the Creek, from just outside of Butte to the Warm Springs Ponds. It also includes associated groundwater contamination. Historically, the creek was used to impound smelter tailings and convey wastes out of Butte. Mining wastes carried from Butte were deposited in the floodplain, impacting water quality throughout Silver Bow Creek.

Stats:

- Streamside Tailings is part of the Silver Bow Creek / Butte Area National Priorities List Site. Silver Bow creek and the near stream flood plain make up the Streamside Tailings Operable Unit. The entire Operable Unit is defined in the Record of Decision as being 22.6 miles in length. The actual stream channel was 23.2 miles in length before the Remedial Action. It is now 25.7 miles in length.
- EPA issued a Record of Decision for Streamside Tailings in 1995, and signed a consent decree for state-lead remedial design and remedial action in 1998 that provided \$80 million plus interest to the Montana Department of Environmental Quality (DEQ) from the Atlantic Richfield Company to implement the remedy.
- DEQ divided the Operable Unit into four Subareas (one through four) for cleanup. The Subareas are between five and six point two miles in length. For ease of tracking the entire Operable Unit was subdivided in to one mile reaches alphabetically (A through T). Work was done on various reaches both sequentially and simultaneously.
- There was one method of Remedial Action: 1) remove contaminants (6.1 million cubic yards), 2) build a new stream channel, (25.7 miles), and 3) cover the flood plain with vegetative borrow soil.
- DEQ finished most of the cleanup work between 1999 and 2015.

- Besides monitoring, DEQ is removing “hot spots” where remedy was unsuccessful and reclaiming some access features.

Butte Mine Flooding Operable Unit (BMFOU 03)

Summary:

The Berkeley Pit is BMFOU’s major feature. It is 1,780 feet deep and encompasses 675 acres. The BMFOU consists of contaminated water in the Berkeley Pit, contaminated water in thousands of miles of associated underground mine workings (lying beneath the City of Butte and Town of Walkerville, as well as beneath the Montana Resources permitted active mine area), and other contaminated inflow to BMFOU. Active mining continues in the Continental Pit nearby, in Montana Resources’ permitted area. The active mining operations use treated sitewater, which affects the water balance in the BMFOU.

Stats:

- EPA issued a Record of Decision for the Butte Mine Flooding OU in 1994, and entered into a consent decree with Atlantic Richfield and Montana Resources in 2002 to implement the remedy.
- Horseshoe Bend Water Treatment Plant was constructed in 2003 and treats approximately 5 million gallons per day (the water treated is from the Horseshoe Bend drainage and is used in Montana Resources mining processes).
- The Berkeley Pit holds approximately 53 billion gallons of water and will be pumped and treated in perpetuity (starting as soon as 2019).
- 10,000 miles of underground workings infiltrated by groundwater.

Warm Springs Ponds Active and Inactive Operable Units (WSPOU 04 and 12)

Summary:

The Warm Springs Ponds surface area include three ponds located at the downstream end of the Site that treat Silver Bow Creek water before discharge to Clark Fork. The Warm Springs Ponds OUs also include associated groundwater contamination and the nearby Mill-Willow Bypass. They cover about 2,500 acres.

Stats: Treated Surface Water

- Flow rates at Warm Springs Ponds fluctuate greatly through the year, and are subject to seasonal conditions and flow. The average baseflow influent is approximately 30 cubic feet per second (13,465 gallons per minute), while annual average is listed as 73 cubic feet per second (32,777 gallons per minute) which takes into account seasonal changes.
- Low flow is 19 cubic feet per second (8,529 gallons per minute) and mean annual peak flow can be as high as 293 cubic feet per second (131,515 gallons per minute).

Rocker Operable Unit (Rocker OU 07)

Summary:

The Rocker OU surface area covers approximately 16 acres and is located south of U.S. Interstate 15/90 near Rocker, Montana, approximately 3 miles west of Butte. It includes soil and groundwater contamination associated with the former Rocker Timber Framing and Treating Plant. The surface boundary of the Rocker OU adjoins the SSTOU on one side. Contaminant of Concern is arsenic. The remedy selected in the 1995 Rocker OU ROD, addresses surface soil, alluvium and groundwater contaminated by wood-treating compounds and mining waste in the Rocker OU.

Stats:

- PRPs excavated 48,000 cubic yards of soils contaminated with arsenic above 1,000 micrograms per liter (µg/L) to a depth of 5 feet below the seasonally low groundwater level. Excavated soil was then treated in a pug mill with iron sulfate and lime amendments. Soil sampling confirmed treated soils had leachable arsenic concentrations below 0.30 milligrams per liter (mg/L). Treated soils were disposed of in an on-site repository.
- The PRP treated groundwater contaminated with arsenic above 1,000 µg/L in open excavation trenches using iron sulfate, lime and potassium permanganate amendments.
- The PRP covered other soils above 380 µg/L with clean cover soil and revegetated the entire area.

Butte Priority Soils Operable Unit (BPSOU 08)

Summary:

The BPSOU surface area covers a 5-square-mile area, and encompasses the Town of Walkerville and a large portion of the City of Butte, as well as associated alluvial aquifer contamination. It is located a few miles west of the Continental Divide at an elevation range of approximately 5,400 to 6,400 feet above mean sea level. The BPSOU is centered on Butte Hill, the location of the historic Butte Mining District. The soils of the Butte Hill were contaminated during historic mining activities beginning in 1864. BPSOU has several programs in place to protect human health and the environment, below is a summary of the main ones including redevelopment work that has went on since before the 2006 Record of Decision.

Butte Reclamation Evaluation System (BRES)

The Butte Reclamation Evaluation System (BRES) provides a practical way to evaluate the stability, integrity, and continued protectiveness of completed reclamation projects. A BRES inspection identifies problems that need to be corrected, ensuring that caps on sources of contamination remain protective over time. Reclaimed areas, including cover-soil caps, must meet clear performance standards as set forth in the BRES. The BRES provides a site-specific method to evaluate the reclamation against the performance standards. Periodic evaluation of reclaimed sites against the BRES performance standards will direct the appropriate level of corrective action work that may be needed at each site.

Residential Metals Abatement Program (RMAP)

The Residential Metals Abatement Program (RMAP) aims to reduce risk from exposure to high metals levels. RMAP is designed to sample and remediate (if necessary) all residential properties in the Butte Priority Soils Operable Unit. The Butte-Silver Bow Health Department performs continuous metals abatement activities in the Butte area through the RMAP. Children living at or frequently visiting properties that exceed action levels, help determine the order of the abatement projects.

BPSOU: Redevelopment

EPA highly encourages redevelopment at Superfund sites. BPSOU workplans have included redevelopment since 1990. There are many examples of Superfund cleanup efforts in Butte improving public health and the environment while allowing for significant redevelopment projects including:

- The Original Mine Yard—the primary stage for the National Folk Festival for the last 3 years.
- The Mountain Con Mine Yard— set to open to the public in spring 2011 with walking trails, public restrooms, a covered gazebo for picnics and a beautiful garden area.
- East Park/Mercury Street Redevelopment Area— site of a number of new buildings including the Belmont Senior Citizens Center and the Butte Central Gymnasium. Both are used daily and serve people from all over the Butte area.
- Granite Mountain Memorial
- Copper Mountain Complex
- Missoula Street Baseball Complex
- Knob Hill Park
- Chamber of Commerce
- Tullamore Subdivision

Stats:

- Butte Treatment Lagoons (BTL): 1200 gpm since 2004 = over 600 billion gallons of Groundwater treated and discharged from BTL
- RMAP: 500-700 children are tested yearly through the WIC program.
- RMAP: 2,697 of 4,294 residential properties within BPSOU have been sampled for soil and dust contamination.
- 467 yards have been excavated and reclaimed. (mine waste is brought to the repository)
- 615 attics and basements cleaned of dust-borne contamination
- BRES: 400 of 704 acres of land on the Butte Hill has been reclaimed and capped (vegetated or rock caps) and more reclamation is scheduled.

- Storm water controls: over 15,000 linear feet of curb and gutter, miles of rock lined ditch and concrete ditch, (5) Hydrodynamic devices, 3 large catch basins and several other small. Sediment basins, forebays, lining of infrastructure and replacement. Operation and maintenance (O&M) is implemented by BSB.

Atlantic Richfield has been cleaning up the Butte Hill since 1988, initially reclaiming several mine waste dumps and yards in Walkerville. Other time critical removal actions included:

- Remediating 80,000 cubic yards of contaminated soil from Timber Butte (1989) and the Colorado Smelter (1992).
- Removing 800,000 cubic yards of the Colorado Smelter tailings (the Old Butte Landfill/Clark Mill Tailings project in 1998).
- Reconstructing more than 1 mile of Silver Bow Creek and its surrounding floodplain.
- Remediating the Clark Mill Tailings and constructing the Copper Mountain Sports and Recreation Complex, which includes sports fields, a playground, driving range, and public restrooms.
- Remediating Lower Area One (2016) and the Wetland Demonstration Area (2016), providing 20+ acres of open space returned to natural habitat.

West Side Soils Operable Unit (WSSOU 13)

Summary:

The SBCBA Superfund Site was amended in 1987 to add the “Butte Area” to the original Silver Bow Creek Superfund Site designated in 1983. Four remedial operable units (OUs) for the Butte Area portion were formed at that time: the Butte Priority Soils Operable Unit (BPSOU), the Butte Mine Flooding OU, the Active Mining Area OU, and the Non-Priority Soils OU. EPA conducted the Butte Soils Screening Study in 1987 to assist with decisions regarding prioritization for further investigations and cleanup within the Butte Portion of the SBCBA site. Data from this study helped establish areas of high priority (i.e., the BPSOU and Butte Mine Flooding OU) and lower priority (i.e., the Non-Priority and Active Mining OUs). The Butte Flats and non-urbanized areas outside of Butte proper were identified as a lower priority because data indicated there was lower potential for adverse human health exposure from metals and arsenic from historic mining sources. Given the proximity of mine waste materials with elevated levels of metals and arsenic within and around certain populated areas in Butte, EPA purposefully created the BPSOU site boundary and dedicated its resources to focus on the high priority issues and investigating and cleaning up the BPSOU through the 1990s and 2000s.

EPA is committed to further characterizing the nature and extent of contamination into WSSOU and is reviewing existing data and scheduled to begin further remedial investigations June 2018.

Stats:

- There are 645 unique soil samples in the database for WSSOU. 290 of the samples were taken prior to the year 2000. 417 of the samples have depth information available.
- 400+ mine waste dumps are located north and west of BPSOU

- The Butte Flats are not associated with mining activity and have lead soil results that do not exceed the BPSOU action levels. There is 1 known sample that the property has since been redeveloped and 1 known arsenic sample that has exceeded and been remediated.

Other Sites located in the Area

Montana Pole Treating Plant Site:

The Montana Pole and Treating Plant, also in Butte, has been a Superfund site since 1987. The Plant operated as a wood treating facility from 1946 to 1984. During most of this period, a solution of about five percent PCP mixed with petroleum carrier oil like diesel was used to preserve poles, posts, and bridge timbers. The PCP solution was applied to wood products in butt vats and pressure cylinders (retorts). Creosote was used as a wood preservative for a brief period in 1969. In July 1985, the EPA Emergency Response Branch began conducting a removal action on the Site to minimize impacts to Silver Bow Creek and to stabilize the Site. EPA excavated approximately 6,000 cubic yards of highly contaminated soils, bagged them, and placed them in storage buildings (pole barns) constructed on-site. Tanks, retorts, pipes, and other hardware were dismantled and stored on-site in a former sawmill building. Two groundwater interception/oil recovery systems were installed to reduce oil seepage into the creek. Contaminated areas of the Site and features of the groundwater recovery system were fenced to restrict public access. In 1991, the United States filed suit against responsible parties in federal district court for a liability determination and the recovery of response costs. Court ordered settlement negotiations resulted in a “cash out” Consent Decree entered on July 16, 1996. EPA recovered some of its past costs and made provisions for the recovery of other costs. Also, the responsible parties provided approximately \$35 million for EPA and DEQ to conduct the Site cleanup. DEQ, with assistance from EPA, is conducting the cleanup at the Site under an EPA/DEQ Site-Specific Superfund Memorandum of Agreement, using funds from the MPTP Settlement Fund. A ROD for the Site was issued by EPA and DEQ in September, 1993.

The Fourth Five Year Review report (April 2017) indicates the remedy has generally functioned as intended, but identified a need for a decision document to update and clarify aspects of the selected remedy in the 1993 ROD. The draft 2018 ESD addresses significant changes with respect to soil-related items related to the forthcoming final offload of treated soils from the LTU, including the following:

- Soil cleanup standards for human exposure;
- Dioxin in treated soil from LTU offloads;
- Management of soils to mitigate potential leaching of PCP from soil to groundwater;
- Clarification regarding future land use; and
- Engineering and institutional controls for soil.

Rhodia (Solvay) Silver Bow Plant Site (RCRA site):

The Rhodia (Solvay) Silver Bow Plant occupies approximately 1.25 square miles south of Ramsay. The plant was constructed in the early 1950s to produce elemental phosphorus. Operations ended in 1997. Rhodia is conducting clean-up activities at and around the facility primarily under the terms of a Resource Conservation and Recovery Act (RCRA) Corrective Action Order issued by the U.S. Environmental Protection Agency (EPA) in 2003. During the plant's years of operation elemental phosphorus and a variety of hazardous wastes were generated, treated, stored, and disposed of at the facility. Interim cleanup activities have been conducted to address many of the most immediate potential environmental hazards. A facility-wide contaminant investigation was approved in 2013.

In 2017, EPA approved a supplemental waste plan for treatment of the contents of the clarifier and designated the clarifier as a corrective action management unit (CAMU) after public notice and comment. The contents of the clarifier will be treated in a Mud Still and construction will begin in 2018. The Human Health Risk Assessment was approved in 2018. The Ecological Risk Assessment is in the process of being finalized. The next step is completion of the Corrective Measures Study which will determine appropriate long term remedies.